

Estimate of the 2009 Harvest  
of Spring Coastal Migrant Striped Bass in Chesapeake Bay

Prepared by

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This report presents the calculation of the 2009 Maryland spring harvest of coastal migrant striped bass in Chesapeake Bay. The method used to estimate the spring trophy season harvest in Maryland was presented in detail in Jones (2003), Barker and Sharov (2004), and Sharov et al. (2005). Results of the 2009 calculations are summarized in Table 1. The specific steps used in the calculation are as follows:

*Estimation of harvest.*

- Maryland charter boat logbook reports provided the census values of daily charter boat harvest (Table 1).
- NOAA MRFSS survey provided estimates of harvest for MD private/rental boats for Waves 2 and 3 (Table 1).
- VMRC provided the preliminary estimate of VA migratory striped bass harvest.

*Harvest apportioned by time.*

- The migrant harvest season overlaps parts of both Wave 2 and 3 of the MRFSS survey. Length distribution of the harvest is known to change over this time period, so total harvest was apportioned into 2-week intervals between April 18 and June 15.
- All Wave 2 landings occurred in the last 2 weeks of the wave.
- 2-week interval proportions for Wave 3 landings were developed as the proportions of the harvest registered in the Maryland charter boat logbook reports (Table 1).
- Total Maryland striped bass harvest per interval was calculated as charter boat harvest + private/rental harvest (Table 1).

*Harvest apportioned by length.*

- Data from the Maryland DNR charter boat volunteer survey were used to develop the length frequency distribution of the Maryland charter boat catch for each 2-week interval (Table 2A). Data from the Maryland volunteer private angler survey were used to develop the length frequency distribution of the Maryland private angler catch and the Virginia catch (Table 2B). For the 2-week periods from May 1-15, May 16-31 and June 1-15, the length frequency data provided by the Maryland volunteer private angler survey was supplemented with charter boat volunteer survey data due to small samples of fish reported.
- Harvest in each interval was distributed by the length frequency distribution for each 2-week interval.
- The number of migrants harvested in Maryland during the spring trophy season was determined by applying length-specific migration probabilities. These probabilities were derived from the estimate of the number of striped bass tagged on the spawning grounds in Maryland that migrate to the Atlantic coast before December of the first year at large (Dorazio et al. 1994). The result was a migrant and resident harvest for each 2-week interval, distributed among interval-specific length groups (Table 3).
- The total 2009 Maryland spring harvest of coastal migrant striped bass in Chesapeake Bay was calculated as the sum over all length groups and 2-week intervals.

- The preliminary estimate of the migrant harvest for Virginia's portion of Chesapeake Bay was provided by VMRC, based on mandatory reporting by recreational anglers and charter boat captains (115 fish).

### *Results and Discussion.*

The estimate of the 2009 Chesapeake Bay spring migrant harvest is 90,654 fish, which is the highest harvest on record (Table 4). The Maryland portion of the Chesapeake Bay migrant harvest is 90,539 migrants (Table 1). The Maryland charter boat migrant harvest is 12,740 fish. The Maryland recreational migrant harvest is 77,799 fish. The VMRC preliminary estimate of the spring 2009 migrant harvest in Virginia is 115 fish. Spring migrant harvest by length group is presented in Figure 1.

An analysis of MRFSS estimates for Waves 2 and 3 in Chesapeake Bay indicates that the 2009 spring harvest is the result of a dramatic increase in the estimate of private angler success (catch rate as fish harvested per angler trip), as opposed to an increase in effort. Although private effort has steadily increased since 2001, and the number of private/rental boat trips in Waves 2 and 3 of 2009 were significantly higher than during the same period in 2008 ( $\alpha = 0.05$ ,  $p < 0.05$ ; Figure 2), this was not the highest effort in the time series, and not significantly different from 2005 and 2006 ( $\alpha = 0.05$ ,  $p > 0.05$ ; Figure 2).

In contrast, estimates of private/rental boat harvest have increased steadily over this past decade with a dramatic increase in 2009 (Figure 3). MRFSS data indicate that the increase in 2009 harvest is due to a two-fold increase in private angler success (2008: 0.120 fish harvested:angler trip, 2009: 0.258 fish harvested:angler trip). A similar increase in private angler success was documented by the MD DNR Spring Creel Survey, which measured Harvest per Angler Trip as 0.29 in 2008, and 0.42 in 2009 (Figure 4). MRFSS data show a slight decrease in 2009 Waves 2 and 3 inland for-hire harvest relative to 2008, due to a slight decrease in catch rate. The for-hire fishery effort has remained constant since 2001 ( $\alpha = 0.05$ ,  $p = 0.14$ ; Figure 2).

### **References**

- Barker, L. S., A. Sharov. 2004. Estimate of the 2004 Harvest and 2005 Quota for Spring Coastal Migrant Striped Bass in Chesapeake Bay.
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- Jones, P. 2003. Estimates of the harvest of coastal migrant striped bass in Chesapeake Bay in the spring of 2003. Report to the ASMFC Striped Bass Technical Committee, November 2003.
- Sharov, A., L. S. Barker, and L. Warner. 2005. Estimate of the 2005 Harvest and 2006 Quota for Spring Coastal Migrant Striped Bass in Chesapeake Bay. Maryland Department of Natural Resources, Annapolis MD.

Table 1. 2009 Chesapeake Bay spring striped bass migrant harvest, distributed among 2-week intervals, based on data from Maryland charter boat log book reports, MRFSS Maryland recreational harvest estimate and VMRC reported migrant harvest (estimate as of 9/16/09). Shaded areas represent no harvest (before April 18<sup>th</sup>), no migrant harvest (after June 15<sup>th</sup>), or no data.

	Interval	Charter Harvest (% by interval)	MD Charter Harvest	MD Private Harvest	MD Total Harvest	MD Charter Migrants	MD Private Migrants	MD Total Migrants	VA Migrants	Bay Total Migrants
Wave 2	Apr 1-17	0	0	0	0	0	0	0		
	Apr 18-30	100	7,706	48,424	56,130	5,945	38,810	44,755		
Wave 3	May 1-15	31	7,476	42,842	50,318	5,751	32,955	38,706		
	May 16-31	30	7,141	41,460	48,601	791	4,614	5,405		
	June 1-15	20	4,805	27,640	32,445	253	1,420	1,673		
	June 16-30	19	4,548	26,258	30,806					
	Wave 3 total	100	23,970	138,201	162,171					
Season total			27,128	160,366	187,494	12,740	77,799	90,539	115	90,654

Table 2A. Length distribution of the 2009 Maryland striped bass spring season harvest as voluntarily reported by charter boat captains, by 2-week intervals between April 18 and June 15. (Shaded areas represent no-take size groups.)

Length Group	April 18-30	May 1-15	May 16-31	June 1-15	Total
17	0	0	0	1	1
18	0	3	146	133	282
19	0	4	238	213	455
20	0	3	207	172	382
21	0	0	147	149	296
22	0	2	135	117	254
23	0	0	93	80	173
24	0	4	106	86	196
25	0	0	51	42	93
26	0	0	52	57	109
27	0	4	43	31	78
28	34	39	35	33	141
29	82	73	41	15	211
30	106	94	43	40	283
31	159	127	36	14	336
32	242	154	41	18	455
33	267	216	21	2	506
34	353	254	28	9	644
35	340	260	16	2	618
36	476	331	16	4	827
37	285	254	11	1	551
38	300	250	12	4	566
39	227	166	4	1	398
40	177	128	7	1	313
41	100	83	2	0	185
42	64	65	1	0	130
43	28	33	0	0	61
44	47	30	0	0	77
45	7	7	0	0	14
46	9	6	1	0	16
47	4	5	0	0	9
48	3	3	0	0	6
49	1	0	0	0	1
50	0	1	0	0	1
51	0	0	0	0	0
52	0	0	0	0	0
53	0	1	0	0	1
<b>n</b>	<b>3311</b>	<b>2600</b>	<b>1533</b>	<b>1225</b>	<b>8669</b>

Table 2B. Length distribution of the 2009 Maryland striped bass spring harvest as reported by private anglers in 2 week intervals between April 18 and June 15. Due to small sample sizes during May 1-15, May 16-31, and June 1-15, the length frequency distribution below was supplemented by voluntary reports from charter boat captains (not shown in table). Shaded areas represent no-take size groups.

Length Group	April 18-30	May 1-15	May 16-31	June 1-15	TOTAL
18	0	0	4	4	8
19	0	0	5	5	10
20	0	0	3	4	7
21	0	0	4	6	10
22	0	0	1	9	10
23	0	0	2	1	3
24	0	0	3	6	9
25	0	0	2	3	5
26	0	0	2	1	3
27	0	0	2	2	4
28	1	0	0	0	1
29	1	1	2	0	4
30	0	1	1	0	2
31	1	2	0	0	3
32	6	3	2	0	11
33	10	3	0	0	13
34	14	2	0	0	16
35	12	2	1	0	15
36	14	5	1	0	20
37	8	4	0	0	12
38	8	2	0	0	10
39	5	2	0	0	7
40	5	2	1	0	8
41	1	2	0	0	3
42	3	0	0	0	3
43	0	3	0	0	3
44	1	0	0	0	1
45	1	0	0	0	1
46	0	0	0	0	0
47	0	0	0	0	0
48	0	0	0	0	0
49	0	0	0	0	0
<b>n</b>	<b>91</b>	<b>34</b>	<b>36</b>	<b>41</b>	<b>202</b>

Table 3. 2009 Maryland spring striped bass migrant harvest, distributed among 1 inch length groups (length as total length).

Length group (inches)	Apr 18-30			May 1-15			May 16-31			June 1-15		
	Charter	Private	Total	Charter	Private	Total	Charter	Private	Total	Charter	Private	Total
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	3	17	20	2	12	14
21	0	0	0	0	0	0	3	20	23	3	17	20
22	0	0	0	0	0	0	5	29	34	4	22	26
23	0	0	0	0	0	0	6	32	38	4	23	27
24	0	0	0	0	0	0	10	60	70	7	42	49
25	0	0	0	0	0	0	8	46	54	5	33	38
26	0	0	0	0	0	0	13	75	88	12	67	79
27	0	0	0	0	0	0	17	99	116	10	60	70
28	10	68	78	14	82	96	21	119	140	17	93	110
29	37	103	140	41	234	275	37	219	256	11	63	74
30	69	0	69	76	436	512	56	325	381	43	244	287
31	143	206	349	142	818	960	65	368	433	21	118	139
32	285	1,616	1,901	226	1,303	1,529	96	575	671	36	199	235
33	388	3,324	3,712	391	2,244	2,635	61	347	408	5	27	32
34	600	5,438	6,038	537	3,065	3,602	95	540	635	26	144	170
35	645	5,202	5,847	614	3,501	4,115	61	366	427	6	36	42
36	972	6,534	7,507	841	4,834	5,675	65	394	459	14	77	91
37	611	3,919	4,530	678	3,896	4,574	47	268	315	4	20	24
38	663	4,042	4,705	688	3,925	4,613	53	301	354	15	83	98
39	512	2,576	3,088	466	2,668	3,134	18	102	120	4	21	25
40	404	2,608	3,012	364	2,090	2,454	32	207	239	4	21	25
41	230	526	756	238	1,377	1,615	9	52	61	0	0	0
42	148	1,584	1,732	187	1,058	1,245	5	26	31	0	0	0
43	65	0	65	95	588	683	0	0	0	0	0	0
44	109	531	640	87	491	578	0	0	0	0	0	0
45	16	532	548	20	115	135	0	0	0	0	0	0
46	21	0	21	17	98	115	5	26	31	0	0	0
47	9	0	9	14	82	96	0	0	0	0	0	0
48	7	0	7	9	49	58	0	0	0	0	0	0
49	2	0	2	0	0	0	0	0	0	0	0	0
50	0	0	0	3	0	3	0	0	0	0	0	0
51	0	0	0	0	0	0	0	0	0	0	0	0
52	0	0	0	3	0	3	0	0	0	0	0	0
<b>n</b>	<b>5,946</b>	<b>38,810</b>	<b>44,756</b>	<b>5,751</b>	<b>32,955</b>	<b>38,705</b>	<b>791</b>	<b>4,614</b>	<b>5,404</b>	<b>253</b>	<b>1,420</b>	<b>1,673</b>

Table 4. Harvest of migrant striped bass in the spring fishery from 1992-2009.

<b>Year</b>	<b>Bay Spring Migrant Harvest</b>
1992	1,013
1993	2,719
1994	3,672
1995	42,634
1996	11,613
1997	21,222
1998	10,021
1999	17,051
2000	26,748
2001	25,728
2002	14,839
2003	43,900
2004	31,404
2005	65,664
2006	67,771
2007	36,328
2008	36,166
2009	90,654



Figure 1. Comparison of Maryland's 2006 through 2009 spring striped bass migrant harvests, apportioned by length.

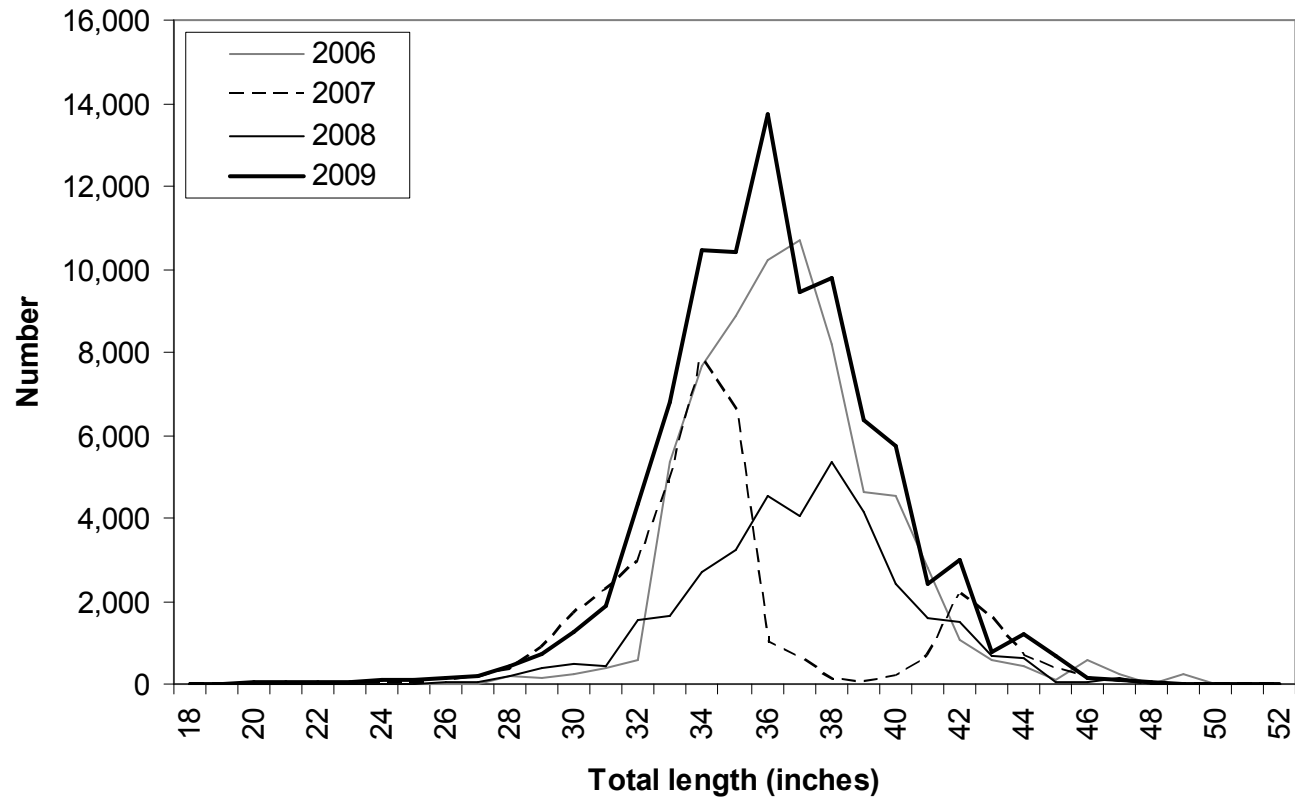


Figure 2. Number of Waves 2 and 3 trips in Maryland's Chesapeake Bay from 1992 to 2009 for for-hire and private/rental boats. Source: MRFSS.

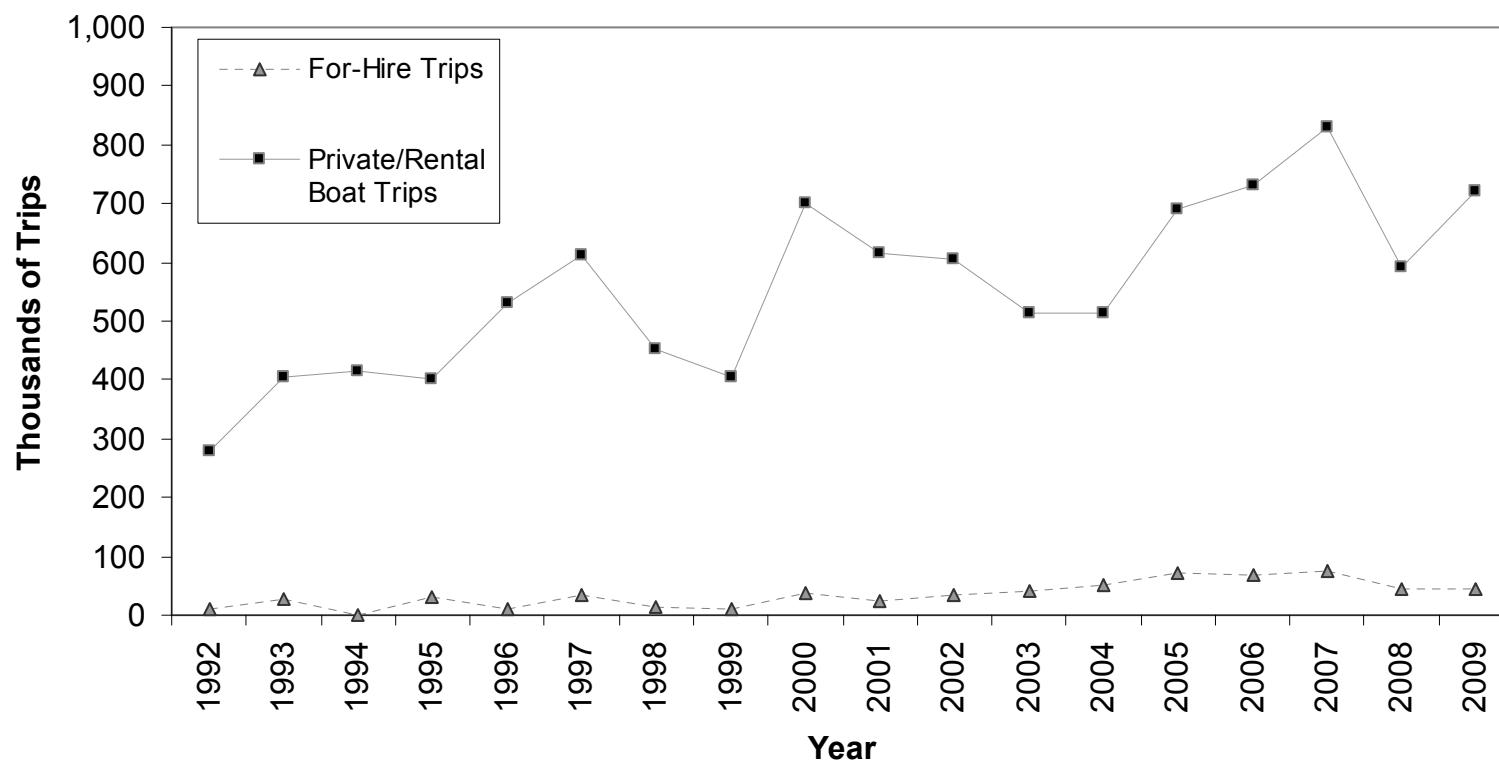


Figure 3. Total Waves 2 and 3 striped bass harvest in Maryland's Chesapeake Bay from 1992 to 2009 by for-hire and private/rental boats. Source: MRFSS.

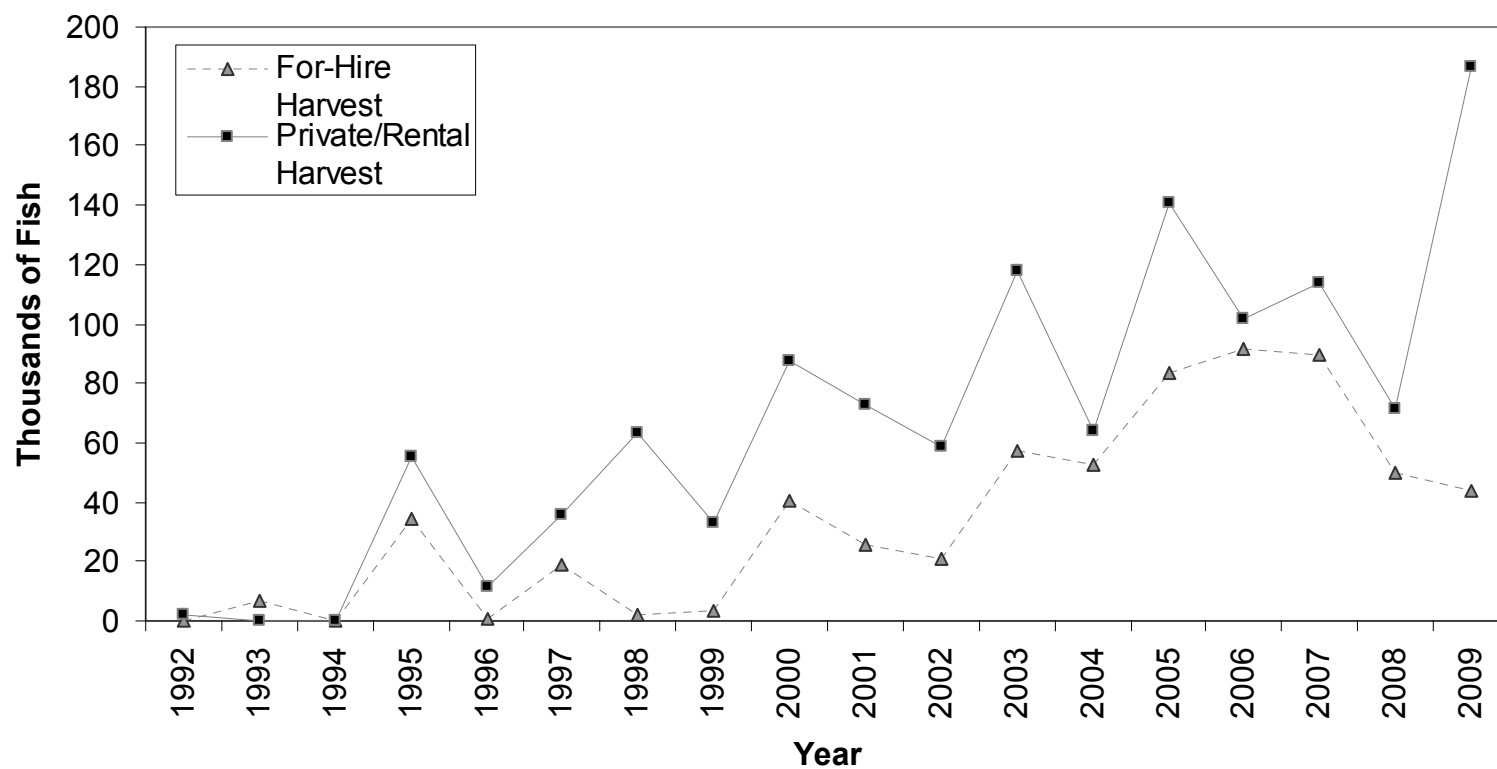
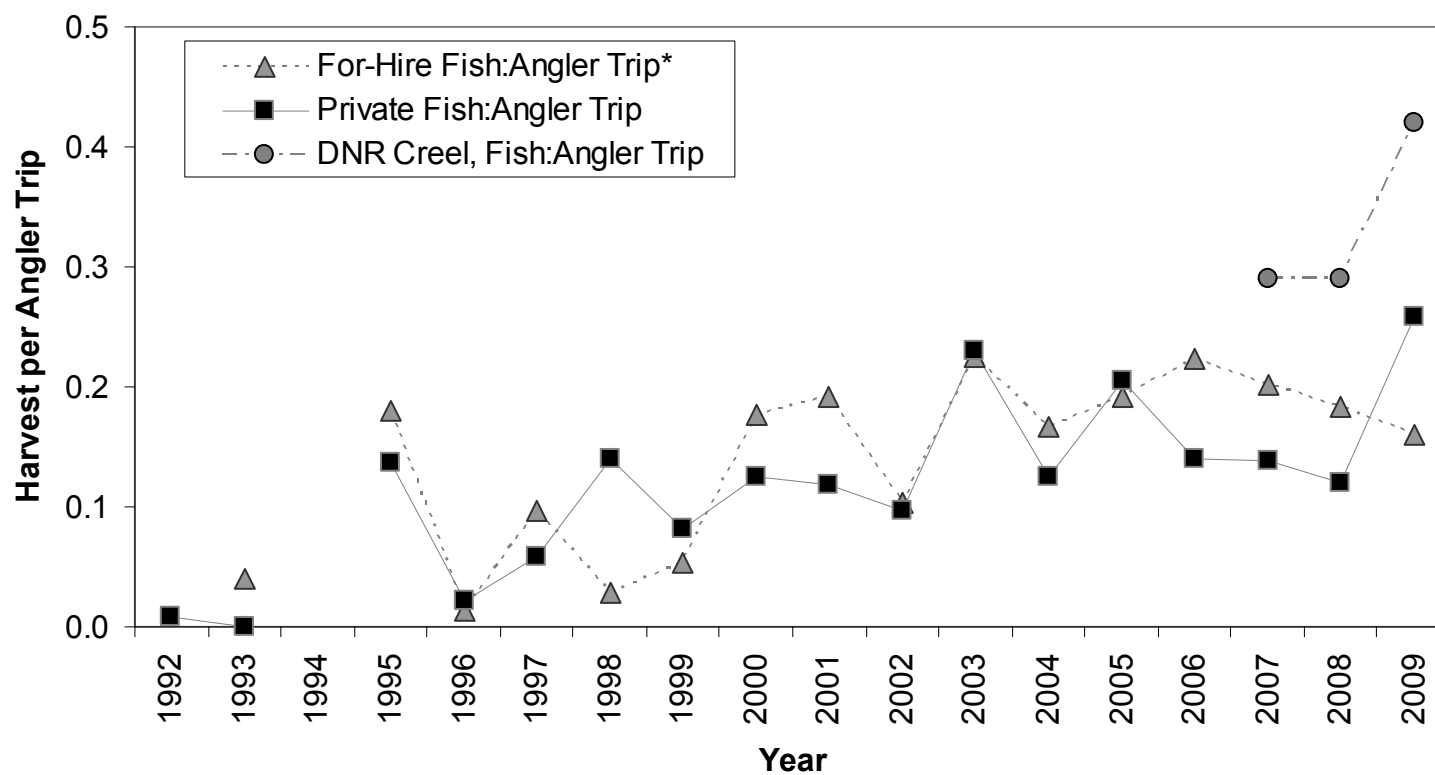


Figure 4. Waves 2 and 3 harvest per trip (HPT) of striped bass in Maryland's Chesapeake Bay from 1992 to 2009 by for-hire and private/rental boats. Source: MRFSS and MDDNR Spring Creel Survey.



\* Calculation assumes 6 anglers per trip